1. Which of the following does not create a magnetic field?
   D) The gravitational attraction between protons and electrons.

2. Which of the following is most responsible for creating the magnetic field of a typical refrigerator magnet?
   C) Electrons spinning.

3. Every magnet has
   C) a pair of poles, one North and one South.

4. The magnetic force
   A) causes like poles to repel each other.

5. The magnetic field lines of a bar magnet
   C) curve from the north to the south pole of the magnet.

6. A friend hands you a rectangular piece of metal, and claims that it has a single magnetic pole, located at the exact center of the object.
   B) Not possible; magnetic poles always occur in pairs.

7. Which would be the least suitable material for making a compass needle?

8. Which would be the most suitable material for making a compass needle?

9. A magnetic domain is a region
   B) within a substance where electron spins are in alignment, creating a magnetic field.

10. Which of the following is not true with respect to magnetic domains?
    C) The more random the domains are, the stronger the magnet will be.

11. Most materials are not magnetic because
    A) the domains are randomly aligned.

12. Can a magnet attract a piece of iron that is not magnetized? Why or why not?
    D) Yes; the domains in the iron are induced into alignment and one pole is attracted to the magnet.

13. You have an unmagnetized piece of iron.
    B) Stroking it with a permanent magnet will align the domains and magnetize it.

14. You have a magnetized piece of iron.
    C) Dropping it repeatedly will cause the domains to randomize, de-magnetizing the iron.

15. What happens if you break a bar magnet into four pieces?
    A) You have four complete magnets, each one having a north and a south pole.

16. When a current is passed through a long straight wire,
    A) a magnetic field is generated. The field lines form circles around the wire.

17. What limits the strength of an electromagnet?
    D) The iron core: once all the domains are aligned, you cannot make the magnet any stronger.

18. An electron moves through a uniform magnetic field. The force on the electron is
    B) perpendicular to both the magnetic field and the electron's velocity.

19. What is the difference between an ammeter, voltmeter, and galvanometer?
    C) They are, in fact, the same instrument, just calibrated to measure different quantities.

20. You are making a simple galvanometer to use as a voltmeter. You can select either a thin or thick wire to make the coil.
    B) Pick thin! The higher resistance will draw the least current when the voltmeter is wired in parallel.

21. You are making a simple galvanometer to use as an ammeter. You can select either a thin or thick wire to make the coil.
    A) Pick thick! The lower resistance means a more accurate reading of the current.
22. An electrical motor
   A) **converts electrical energy to mechanical.**

23. The Earth’s magnetic field is generated
   C) **by convection currents deep within the molten outer core of the planet.**

24. How stable is the earth’s magnetic field?
   A) It seems stable to us, but there is evidence that the field has reversed polarity many times.

25. Help! My pigeon has a magnet up his nose!
   B) Ok, it isn't exactly a bar magnet wedged up his nostril (beak–stril?). But pigeons do have the ability to navigate using the earth’s magnetic field.